

EXHIBIT

204

Semi-Strong Form Market Efficiency in Thinly Traded Markets: Evidence from Stock Price Reaction to Major National and International Events

C. Justin Robinson & Prosper Bangwayo-Skeete

Justin Robinson*

Faculty of Social Sciences, The University of the West Indies, Cave Hill Campus, Bridgetown, Barbados

Prosper Bangwayo-Skeete

Department of Economics, The University of the West Indies, Cave Hill Campus, Bridgetown, Barbados

*Corresponding Author: Justin Robinson, Faculty of Social Sciences, The University of the West Indies, Cave Hill Campus, Bridgetown BB11000, Barbados; Tel.: 1-246-4174279; Fax: 1-246-4389104; Email: cjfrobinson68@gmail.com

ABSTRACT

This study uses the event study methodology adjusted for thin trading, to explore semi-strong form market efficiency in the context of thin trading. The paper does this by investigating stock price reaction to major national and international news events in six frontier stock markets, which are among the least active in the world. The national events studied include natural disasters, parliamentary elections and credit rating reviews, while the international events studied include international terrorist incidents, major events surrounding the 2007/2008 sub-prime mortgage crisis and the United Kingdom's referendum on membership in the European Union (Brexit). The results show that in sharp contrast with more active traded markets, stock prices on these thinly traded markets did not react to the vast majority of major news events, and only tended to react to rare events with major consequences. In almost all cases where there was a stock price reaction to a news event, the reaction was significantly delayed, which is inconsistent with semi-strong form market efficiency. The implication is that thin trading may be associated with semi-strong form inefficient markets, and as such stock prices in thinly traded markets prices may not fully reflect all relevant available information, and may be of limited value to a variety of decision makers.

Key words: thin trading, frontier stock markets, market efficiency, developing countries, Caribbean.

1.0 Introduction

Stock markets have become almost ubiquitous institutions across the world, and at July 31 2016, only eight of the 206 sovereign states recognized by the United Nations did not have a stock exchange (Andorra, Brunei, Comoros, Marshall Islands, Nauru, North Korea and Angola). The proliferation of stock markets around the world means that the efficiency of these markets is a matter of some concern for a large and diverse number of countries, and decades of research has produced a voluminous academic literature providing many insights into the issue of market efficiency. However, while stock markets across the world are a diverse bunch, and vary widely in terms of size and levels of trading activity, this voluminous body of research has focused almost exclusively on stock markets in developed countries and the larger developing countries, which tend to be the larger and more actively traded markets.

Tables 1, 2 and 3 provide some insight into the diversity of stock markets around the world. For example, whilst at the end of 2015, the average number of companies listed on a stock exchange was 949, the number ranged from two listed companies in the Seychelles to 5,280 in India (see table 1), and over thirty percent of stock exchanges world-wide had less than 30 listed companies. Similarly, while the average stock market capitalization to GDP (the other widely used measure of market size), stood at 71% of GDP, it ranged from 0.01% in Namibia to 1072% in Hong Kong (see table 2). In terms of trading activity, whilst the average annual turnover ratio (annual value traded / market capitalization) was 47.80, it ranged from 0.18 in Luxembourg to 1,414 in Namibia (see table 3), and over seventy percent of stock exchanges had a turnover ratio that was lower than average.

The turnover ratios provide an example of the deficiencies in the current academic literature. The turnover ratios suggest that relatively low levels of trading or what is termed “thin trading,”

is a feature of a relatively large number of stock markets, however, the current literature tells us very little about market efficiency in the context of thin trading. This paper begins to fill a gap in the literature by investigating semi-strong form market efficiency in six of the least actively traded stock markets in the world. The paper does so by analyzing the reaction of stock prices on these thinly traded markets to major national and international news events. The events studied in the paper include national natural disasters, parliamentary elections, sovereign credit rating reviews, international terrorist incidents, major events surrounding the 2007/2008 sub-prime mortgage crisis, and the United Kingdom's referendum on membership in the European Union, the so-called Brexit. These events are chosen because of their prominence in the news media, potential for significant economic impact and their capacity to influence investor sentiment.

The rest of the paper proceeds as follows: section 2 provides a brief review of prior research on stock price reactions to major news events, section 3 discusses the data and methodology, section 4 presents and discusses the results and lastly section 5 provides a summary and conclusion.

2.0 Literature Review

The Efficient Market Hypothesis (EMH) identifies three categories or levels of market efficiency as summarized by Fama (1970 & 1976). The three levels are weak form, semi-strong form and strong form market efficiency. This study investigates stock market reaction to major news events and as such is focused on semi-strong form market efficiency.

There is a rich academic literature on semi-strong form market efficiency. In terms of stock price reaction to major news events, a number of event studies focus on the stock market reaction to what may be termed negative news events such as terrorist attacks, natural disasters and other catastrophes. Studies by Barrett, Heuson, Kolb and Schropp (1987), Maloney and Mulhenrin (1998), Brooks, Patel and Tie (2003), Karolyi & Martell, (2006), Thompson, Zaman and

Kirmani (1994), Lamb (1995, 1998), Angbazo and Narayanan (1996), Ewing, Hein and Kruse (2005), Carter and Simkins, (2002), Vasilis and Katerina (2006) and Capelle-Blancard and Laguna (2009), among others, all point to an immediate and statistically significant adverse stock price reaction to the announcement of a wide range of catastrophes and disasters.

In a similar vein, there is a large body of research which indicates that investors view political elections and sovereign credit rating reviews as relevant information, and that there tends to be an immediate and statistically significant price adjustment to the announcement of the results of political elections and sovereign credit rating reviews. Seminal contributions to the literature on political elections and the stock market include, Allvine and Oneill (1980), Huang (1985), Stovall (1992), Smith (1992), Gartner and Wellershoff (1995), Henzel and Ziemba (1995), Booth (2003), Pantzalis, Stangeland and Turtle (1999). While studies by Cantor & Packer (1996), Kaminsky & Schmukler (2002), Reinhart & Rogoff (2004), Bissoondyal-Bheenick (2004), Kim & Wu (2004), Norden, & Weber (2004), Brooks et al (2004), Pukthuanthong-Le et al (2007), Hooper et al (2008), Brooks, Faff, Treepongkaruna & Wu (2011), Klimaviciene (2011), Michaelides, Milidonis, Nishiotis & Papakyriacou (2012) and Ftanassi, Ftiti and Hasnaoui (2014) all provide evidence on stock price adjustment to the announcement of changes in sovereign credit ratings. Specifically, the above-mentioned literature finds that there is an immediate and statistically significant adverse stock price reaction to the announcement of downgrades in sovereign credit ratings, but no such adjustment to upgrades, maintenance of existing ratings or changes in the outlook.

In summary, the academic literature suggests that stock prices immediately react to major news events including catastrophes, political elections and sovereign credit rating reviews. However, these studies have focused on the USA and the larger markets in Europe, Asia and Latin

America. These markets are among the most active in the world, and while there is a growing literature on the weak form market efficiency of the smaller less active stock markets, there is a paucity of literature on the semi-strong form market efficiency of these smaller and less active markets. This paper adds to the financial economics literature by exploring semi-strong form market efficiency in the context of thin trading by exploring stock price reaction to major news events on six of the least active stock markets around the world.

3.0 Data and Methodology

3.1 Data and Events Description

This paper explores the issue of semi-strong form efficiency in thinly traded markets by investigating stock price reaction to a range of major news events on six of the least active stock markets in the world over the period January 1 2000 to June 30 2016. The six markets studied are the Barbados (BSE), Bahamas (BISX), Eastern Caribbean (ECSE), Guyana (GASCI), Jamaica (JSE) and Trinidad and Tobago (TTSE) stock exchanges. These six exchanges are all located in the Caribbean which is of special interest to the author. However, in addition, and more importantly these exchanges all have turnover ratios of less than ten, compared to the global average of 31.78, making them among the least active markets in the world, and the BSE, BISX, GASCI and ECSE are among the twenty least active exchanges in the world (see table 3). As such these markets provide a useful context for exploring semi-strong form market efficiency in the context of thin trading.

The events studied are natural disasters, political elections, sovereign credit rating reviews, international terrorist events, the events surrounding the 2007/2008 international financial crisis and the referendum on the United Kingdom's membership in the European Union. These events

are chosen because of their likely of impact on stock market investors due to the prominence of these events in the in the news media, their potential for significant economic impact and their capacity to influence investor sentiment.

In terms of national events, the paper studies stock price reaction to the five major hurricanes to make landfall in the Caribbean (Hurricanes Michelle, Ivan, Dean, Wilma and Sandy) over the sample period, the thirty-nine general elections and fifty-four sovereign credit rating reviews that occurred in the chosen markets over the sample period.

Hurricanes are the major natural disasters to hit the Caribbean and can cause major economic dislocation and loss of life. Hurricanes Michelle, Ivan and Dean caused major damage in the Caribbean. Hurricane Michelle caused an estimated US\$300ml in damage in the Bahamas and an estimated US\$18 million in Jamaica. Hurricane Ivan devastated Grenada causing an US \$1.1billion for Grenada, US\$360million in Jamaica, US\$40million in St. Vincent & The Grenadines and US\$20million in St. Lucia. Hurricane Dean caused damage estimated at US\$300 million in Jamaica, US\$162 million of damage in Dominica, and US\$6.4million St. Lucia

Sovereign credit ratings are widely used as indicators of the likelihood of sovereign debt default, and changes in these credit ratings attract major attention in the investment community. The sovereign credit rating actions over the sample period included eleven upgrades, eleven outlook changes, nine affirmations of ratings and twenty-three downgrades. Similarly, general elections are among the most high profile events in these countries and command tremendous media and popular attention. The management of the economy is often a major issue in these elections and public commentary suggests that election outcomes have major implications for the economy.

In terms of international events, the papers studies stock price reaction to major international terrorist events, some of the major events surrounding the sub-prime mortgage crisis of 2007/2008, and the UK referendum on its membership in The European Union (Brexit), June 23, 2016. The specific terrorist events studied are the September 11, 2001 bombings in New York, the Madrid train bombings of 2004, the London 2005 bombings and the Bali 2002 and 2005 bombings). These incidents were chosen primarily because of their international prominence of the events, the strong trade and other links between the Caribbean and the USA and United Kingdom, and the fact that Bali is a world famous tourist destination like a number of Caribbean countries.

The events surrounding the 2007/2008 financial crisis studied are the announcement of major losses on Mortgage Backed Securities at Bear Stearns 2007, the first bank run in the UK in 100 years in 2008, the acquisition of Bear Stearns by JP Morgan, Lehman Brothers filing for bankruptcy and the launch of the Troubled Assets Relief Program (TARP).

The dates of these one-hundred and eight events, the daily closing prices for the securities listed on the six stock exchanges and the six stock market indices constitute the basic dataset for this study. In effect one hundred and eight three events studies are conducted, these being, five hurricanes (five event studies are conducted for each of the six markets making for thirty event studies), ten international events (ten event studies are conducted for each of the six markets making for sixty events studies), thirty nine political events (event studies are conducted only for the country holding the election) and fifty-events studies related to sovereign credit ratings (event studies are conducted only for the country whose credit rating was being assessed).

3.2 Methodology

In order to investigate stock market reaction to the various events outlined in the previous paragraph, this paper utilizes the widely used event study methodology (see for example Hillier and Marshall, 2002; Gunasekarage and Power (2006, 2002); Dennis and McConnell (1986); Al-Yahyaee, Pham and Walter (2011); Gurgul, Mestel and Schleicher (2003); Harada and Nguyen (2005) and Benartzi, Michaely and Thaler (1997)). While the event study methodology is now standard and widely utilized, due to the fact that the vast majority of studies are done on developed countries, the standard methodology overlooks the problem of low trading volumes on markets, or what is termed “thin trading.” Thin-trading is a feature of a number of stock exchanges around the world as shown in table 3, therefore, this study adopts the Geyt, Cauwenberge & Bauwhede (2013) adjustment for thin trading.

The event study approach seeks to track the impact of an event on stock prices around the occurrence of the event. Each event is presumed to occur on date zero denoted $t = 0$. The first step in the process is to estimate the “expected *normal* return” using a statistical model. In this study we utilize the adjusted market model, initially introduced by Dimson (1979) but recently popularized by Geyt et al. (2013) and Buysschaert et al. (2004). In the adjusted market model, stock returns depend on leads, current and lagged market returns instead of only the contemporaneous market return. In line with Geyt et al. (2013) and Buysschaert et al. (2004), we add one leading and three lagged market returns to the model:

$$R_{it} = \alpha_i + \sum_{k=-3}^1 \beta_{ik} R_{m,t+k} + \epsilon_{i,t} \dots \dots \dots (1)$$

where R_{it} represents the daily return on stock i on day t , $R_{m,t+k}$ is the adjusted return on the stock market index for day $t + k$ and $\epsilon_{i,t}$ denotes the error term. The error term also represents the component of returns that is abnormal or unexpected, such that the predicted expected or normal returns equation becomes:

$$E(R_{it}) = \alpha_i + \sum_{k=-3}^1 \beta_{ik} R_{m,t+k} \dots \dots \dots (2)$$

where, α_i and β_{ik} are ordinary least squares parameter estimates. This normal return model provides the expected return unconditional on the event, and is normally estimated at least 120 days spanning from day $t = -31$ to $t = -150$ prior to the event’s occurrence.

The second step in the event study methodology involves calculating the stock’s abnormal returns, AR_{it} , for each firm, per day, over the event window. The event window is the period of

interest reflecting the days around the event date, and the objective is to analyze the stock return's behavior during the event window. In order to achieve robust results, five overlapping event windows are used with the widest window being 30 days before and 30 days after the event date. Investigating over different window ranges provides insights into short term versus long term effects on returns. In the case of international terrorist incidents the event window is 30 days after the event given the likely unpredictability of such events. The daily abnormal returns, i.e., the predicted error during the event window, is computed as:

$$AR_{it} = R_{it} - E(R_{it}) \dots\dots\dots(3)$$

where AR_{it} is the current day abnormal return; R_{it} represents the current day actual return and $E(R_{it})$ the expected normal return obtained from equation (2). This daily abnormal return is a direct measure of the (unexpected) change in stockholder wealth associated with the event.

3.2.1 Aggregating Across Firms

For each individual event, abnormal return observations and relevant statistical tests are calculated for stock, for each day within the event window. Drawing statistical inferences for the reaction of the overall market to an event requires aggregating the abnormal returns across all firms. For each day, t , in the event window, the sampled average abnormal returns (AAR_t) are aggregated over all N firms as:

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \dots\dots\dots(4)$$

3.2.2 Aggregating over time within the event window

The event study methodology also tests for the persistence of the effect over the event window ($T_2 - T_1$). This is done by examining whether the average abnormal returns for the days around the event are equal to zero. Therefore average abnormal returns are summed to obtain the cumulative average abnormal returns ($CAAR(T_1, T_2)$) for N firms over the event window.

$$CAAR(T_1, T_2) = \sum_{t=T_1}^{T_2} AAR_t \dots\dots\dots(5)$$

3.2.3 Sampling distributions of t-test statistics

The t-statistic for each day is computed as:

$$t = \frac{CAAR(T_1, T_2)}{\frac{\sigma_{CAAR(T_1, T_2)}}{\sqrt{N}}} \dots\dots\dots (6)$$

where σ denotes the standard deviation. While the test-statistic is estimated per event day, in order to make an inference over the entire event window, the cumulative average abnormal returns over the event window is used. To address the question of significance we use a robust regression approach that controls for robust standard errors. In this approach the CAAR is regressed on a constant and the estimated constant is the mean of CAAR over the event window.

One hundred and eighty three event studies were undertaken, however, only the statistically significant results are reported¹ and discussed in the next section.

4.0 Results and Discussion

In a semi-strong form efficient market, stock prices adjust instantaneously and accurately to relevant information. The results of the one hundred and eighty three event studies conducted in this paper, indicate that stock prices adjusted instantaneously and accurately to three of the events studied, adjusted accurately but in a delayed manner to eleven of the events studied and there was no statistically significant price adjustment to one hundred and sixty nine of the events studied.

Stock prices on the JSE adjusted instantaneously and accurately to the September 11, 2001 terrorist incidents (see table 4), the launch of the Troubled Assets Recovery Program (TARP) in the United States 2008 (see table 5) and the announcement of the success of the “Leave” campaign in the referendum on the United Kingdom’s membership of the European Union (Brexit) (see table 6). Stock prices on the JSE adjusted accurately but in a delayed manner to the

¹ The t-statistics and their corresponding p-values for each day (in the event window) are available on request.

passage of Hurricanes Michelle and Ivan (see tables 7 and 8), and general elections in Jamaica (see tables 9 and 10), whilst prices on the BISX, BSE, TTSE and ECSE adjusted accurately but in a delayed manner to general elections in The Bahamas (2002 and 2012), Barbados (2008 and 2013), Trinidad and Tobago (2002 and 2010) and Grenada (2008) respectively (see tables 11 to 17). As mentioned previously, there was no statistically significant stock price reaction to the other one hundred and sixty nine events studied in this paper.

The results point to three major findings. Firstly, stock prices on the six exchanges did not react to the vast majority of events studied in this paper. Secondly, stock price adjustments consistent with semi-strong form market efficiency were rare, only occurred on the JSE, and only for major global events with the potential for significant long-term economic fallout. Thirdly, general elections were the only events to generate a statistically significant price adjustment across all exchanges, but the price adjustments were significantly delayed and hence inconsistent with semi-strong form market efficiency.

In light of the above mentioned results, a conclusion as to whether or not the evidence points to semi-strong form market efficiency, will depend heavily on whether or not the absence of a statistically significant stock price adjustment to a number of the events studied in this paper can be deemed an “accurate” response. In a number of cases, no statistically significant price adjustment can be deemed an “accurate” response and hence consistent with semi-strong form market efficiency. For example, there was no price adjustment to the Madrid train bombings of 2004, the London 2005 bombings and the Bali 2002 and 2005 bombings on any of the six exchanges. Given the relatively weak economic linkages between these countries and the Caribbean countries studied in this paper, it can be argued that the information was not relevant and the stock price response was arguably accurate. Similarly, Barbados, Guyana and Trinidad

and Tobago did not suffer major damage from the passage of any hurricanes over the sample period and therefore the information may not have been relevant, and the absence of any stock price adjustment may be deemed accurate and consistent with semi-strong form market efficiency.

However, given the strong economic ties to the United States and the potential economic fallout, the September 11 2001 terrorist incidents appear to be relevant, and the absence of any stock price adjustment to the event on the BISX, BSE, ECSE, GASCI and TTSE appears inconsistent with semi-strong form market efficiency. Similarly, the Bahamas and the countries in the Eastern Caribbean suffered major economic fallout from Hurricanes Michelle, Ivan, Dean, but there was no stock price adjustment on either the BISX or ECSE. Given the damage caused by these storms, the passage of the storms appears to be relevant information for investors and the absence of any stock price adjustment to the passage of these storms again appears inconsistent with semi-strong form market efficiency.

The absence of a statistically significant stock price adjustment to any of the twenty-three sovereign credit rating downgrades is particularly striking in light of the findings from previous studies on stock price reaction to sovereign credit rating reviews. In the context of a semi-strong form efficient market, the absence of a stock price reaction to a credit rating action would imply that investors either do not view sovereign credit ratings and debt yields as relevant information, do not view credit ratings as credible signals for sovereign debt default and yields, investors fully anticipate ratings announcements, hence no reaction to the actual announcement of the rating, or investors have other more credible signals for changes in the likelihood of sovereign debt default or yields.

Given the well documented negative economic consequences associated with sovereign debt defaults, debt restructurings, increases in sovereign debt yields or reduced market access, it appears difficult to argue that sovereign credit ratings are not relevant information for equity investors. Therefore, unless one can provide evidence as to why credit rating actions are not viewed as credible signals, why investors are able to fully anticipate ratings announcements, or what other more credible signals investors possess, the absence of any statistically significant price adjustment to the twenty-three sovereign credit rating downgrades, including a downgrade to non-investment grade status (Barbados 2012), appears inconsistent with semi-strong form market efficiency.

In summary, the delayed stock price reaction to eleven of the one hundred and eighty three events studies in this paper, and the absence of a statistically significant stock price reaction to a number of economically significant events and seemingly relevant events, especially the twenty three sovereign credit rating downgrades suggests that the thinly traded stock markets in the Caribbean may not be semi-strong form efficient.

.Summary and Conclusion

This paper uses the event study methodology adjusted for thin trading to investigate semi-strong form market efficiency in thinly traded markets. The paper studies stock price reaction on six of the least active stock markets in the world to one hundred and eighty three events ranging from disasters and catastrophes to the events surrounding the 2007/2008 international financial crisis and Brexit, as a means of shedding some light on this phenomenon.

Among the one hundred and eighty three events studies conducted, there were only three instances of stock price adjustments that were consistent with a semi-strong form efficient market. These were in the cases of the JSE's reaction to the September 11, 2001 terrorist

incidents, the launch of the Troubled Assets Recovery Program (TARP) in the United States 2008 and the announcement of the success of the “Leave” campaign in the referendum on the United Kingdom’s membership of the European Union June 23 2016 (Brexit).

There was a statistically significant stock price reaction to two of the five hurricanes and nine of the thirty nine general elections studied in this paper. However, in all eleven cases the stock price reaction was significantly delayed which is inconsistent with a semi-strong form efficient market. Stock prices did not adjust to one hundred and sixty nine of the one hundred and eighty three events studied in this paper. The absence of any stock price adjustment on the BISX, BSE, ECSE, GASCI and TTSE to the September 11 2001 terrorist bombings or any of the events surrounding the global financial crisis of 2007/2008, the absence of any stock price adjustment on the BISX, BSE, JSE and TTSE to any of the nineteen sovereign credit rating downgrades and the absence of any stock price adjustment on the BISX and ECSE to major natural disasters and catastrophes, all appear inconsistent with semi-strong form market efficiency. These findings are also inconsistent with the previous literature documenting stock price reaction to similar events on larger and more actively traded stock markets.

The evidence provided in this paper suggests that the six stock markets in the Commonwealth Caribbean may not be semi-strong form market efficient. These six stock markets are among the least active in the world and the results of this study suggests that thin trading may be associated with semi-strong form market inefficiency. The implication is that stock prices on thinly traded markets may not fully reflect all relevant publicly available information. As such, it may raise questions as to the utility of such prices in guiding investors and policymakers. If market prices are to play their expected role in guiding asset allocation, policy makers may do well to focus on measures to enhance the levels of trading activity on thinly traded stock markets.

Table 1: Number of Companies Listed on Stock Exchanges

Country	# Of Listed Companies	Country	# Of Listed Companies	Country	# Of Listed Companies
Seychelles	2	Mauritius	64	Italy	295
Cayman Islands	4	Belarus	65	Iran, Islamic Rep.	336
Namibia	7	Tunisia	66	South Africa	336
Uganda	9	Kazakhstan	69	Mongolia	339
Costa Rica	9	Morocco	75	Brazil	360
Papua New Guinea	9	Colombia	77	Bangladesh	368
Lebanon	10	Romania	77	Bulgaria	390
Guyana	11	Austria	86	Russian Federation	426
Eastern Caribbean	12	Slovak Republic	96	Indonesia	461
Armenia	12	Argentina	98	Singapore	471
Bermuda	14	Cyprus	101	Israel	529
Malawi	14	United Arab Emirates	112	France	557
Czech Republic	15	Oman	116	Thailand	574
Fiji	17	Netherlands	127	Pakistan	590
Kyrgyz Republic	18	Uzbekistan	132		
Barbados	20	Mexico	133	Germany	645
Zambia	20	Belgium	139	Poland	751
Bahamas	22	Georgia	139	Bosnia and Herzegovina	794
Malta	22	New Zealand	148	Serbia	801
Luxembourg	27	Kuwait	153	Malaysia	919
Trinidad and Tobago	28	Saudi Arabia	156	Hong Kong SAR, China	1517
Panama	29	Ukraine	165	Korea, Rep.	1817
Ghana	30	Norway	183	Australia	1950
Macedonia, FYR	34	Nepal	188	United Kingdom	1978
Cote d'Ivoire	38	Nigeria	196	China	2361
Bolivia	39	Montenegro	206	Japan	2792
Qatar	43	Peru	206	Spain	3344
Bahrain	44	Croatia	218	Canada	3866
West Bank and Gaza	45	Chile	228	United States	4269
Venezuela, RB	46	Switzerland	242	India	5280
Ireland	46	Egypt, Arab Rep.	248	World	45249
Hungary	48	Jordan	249		
Portugal	49	Philippines	254	Average	949
Jamaica	53	Greece	260	Minimum	2
El Salvador	60	Turkey	267	Maximum	6533
Kenya	60	Sri Lanka	273	Range	6531
Source: United Nations World Development Indicators					

Table 2: Stock Market Capitalization To GDP

Country	Market Capitalization to GDP	Country	Market Capitalization to GDP	Country	Market Capitalization to GDP
Namibia	0.01	Lebanon	27.99	France	72.64
Armenia	1.39	Sri Lanka	28.31	Israel	72.82
Kyrgyz Republic	2.27	Iran, Islamic Rep.	29.42	Spain	74.08
Costa Rica	3.81	El Salvador	29.50	Barbados	77.00
Slovak Republic	5.02	Panama	29.97	Japan	81.80
Macedonia, FYR	6.06	Portugal	30.01	Qatar	83.15
Georgia	6.86	Kenya	30.24	Netherlands	84.16
Romania	8.01	Turkey	30.72	Jordan	85.68
Ghana	8.50	Jamaica	32.12	St. Kitts and Nevis	86.15
Argentina	9.36	Cote d'Ivoire	32.97	Thailand	88.52
Serbia	9.63	Poland	33.41	Korea, Rep.	91.48
Fiji	11.70	New Zealand	36.12	Australia	94.72
Nigeria	12.10	Bangladesh	36.59	Papua New Guinea	105.66
Zambia	13.57	Russian Federation	37.03	Chile	108.02
Mongolia	13.63	Mexico	39.37	Canada	114.95
Bosnia and Herzegovina	13.70	Croatia	39.56	Luxembourg	123.37
Kazakhstan	13.81	United Arab Emirates	41.66	United States	127.92
Cyprus	14.27	Malta	43.29	Malaysia	143.54
Bulgaria	14.63	Germany	43.85	Switzerland	203.36
Slovenia	15.04	Indonesia	44.07	South Africa	237.34
Hungary	15.15	Brazil	45.13	Singapore	244.65
Malawi	16.46	Peru	46.54	Hong Kong SAR, China	1072.51
Bolivia	16.96	Oman	46.55	Trinidad and Tobago	
Guyana	17.85	Ireland	50.53	Bahamas, The	
Pakistan	18.33	Norway	50.90	World	82.39
Greece	22.01	Colombia	54.18		
Ukraine	22.12	Morocco	55.13	Average	71
Tunisia	22.64	China	55.15	Minimum	3
Vietnam	23.37	Saudi Arabia	60.10	Maximum	1081
Egypt, Arab Rep.	23.68	Bahrain	65.02	Range	1078
Italy	24.75	Belgium	65.60		
Bermuda	25.52	South Asia	67.85		
Austria	25.58	Mauritius	69.91		
Uganda	26.13	India	71.79		
Source: United Nations World Development Indicators					

Table 3: Stock Market Turnover Ratios Across The World

Luxembourg	0.18	Nigeria	9.09	Canada	67.13
Cayman Islands	0.20	Lebanon	10.22	Australia	68.79
Georgia	0.24	West Bank and Gaza	10.45	Netherlands	70.86
Uganda	0.28	Ireland	11.25	Brazil	71.34
Bolivia	0.40	Oman	11.59	Thailand	78.37
Papua New Guinea	0.41	New Zealand	11.84	Germany	91.08
Armenia	0.57	Colombia	11.89	Saudi Arabia	96.43
Zambia	0.64	Tunisia	14.05	Spain	103.27
St. Kitts and Nevis	0.80	Sri Lanka	14.56	Japan	115.96
El Salvador	1.01	Chile	14.71	Korea, Rep.	140.19
Fiji	1.44	Jordan	15.28	Turkey	162.50
Malta	1.51	Iran, Islamic Rep.	15.32	United States	182.61
Montenegro	1.57	Romania	16.35	Italy	191.64
Bahrain	1.79	Philippines	16.50	China	235.15
Panama	1.92	Qatar	19.96	Namibia	1414.38
Barbados	2.05	Indonesia	24.79	World	128.84
Malawi	2.28	Mexico	25.87	Average	47.80
Bermuda	2.60	South Africa	27.72	Minimum	0.18
Costa Rica	2.66	United Arab Emirates	28.54	Maximum	1414.38
Cote d'Ivoire	3.14	Malaysia	29.35	Range	1414.21
Kazakhstan	3.69	Pakistan	30.13		
Croatia	4.11	Egypt, Arab Rep.	31.79		
Mongolia	4.24	Austria	31.96		
Peru	4.32	Israel	33.63		
Bulgaria	4.51	Belgium	35.57		
Argentina	4.79	Singapore	37.05		
Mauritius	5.10	Poland	38.52		
Jamaica	5.11	Vietnam	41.52		
Slovak Republic	5.41	Russian Federation	44.51		
Ghana	5.83	Greece	48.90		
Ukraine	5.94	Hong Kong SAR, China	51.20		
Kyrgyz Republic	5.99	South Asia	52.70		
Macedonia, FYR	6.11	India	54.02		
Morocco	6.74	Norway	56.21		
Slovenia	6.84	Portugal	58.76		
Kenya	7.24	Switzerland	58.76		
Bangladesh	8.14	Hungary	62.91		
Cyprus	8.27	France	63.94		
Source: United Nations World Development Indicators					

Table 4: Stock Price Adjustment on JSE to World Trade Centre Bombing 9/11/2001

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(0, 5)	-0.158	0.051	-3.090	0.004
(0, 3)	-0.160	0.058	-2.730	0.011
(0, 2)	-0.164	0.071	-2.320	0.031
(0, 1)	-0.097	0.084	-1.150	0.260
(0)	-0.231	0.091	-2.530	0.03

Table 5: Stock Price Adjustment on JSE to Launch of Troubled Asset Relief Program in USA 10/14/2008

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	-0.204	0.057	-3.590	0.001
(-3, 3)	-0.198	0.057	-3.490	0.001
(-2, 2)	-0.179	0.054	-3.290	0.002
(-1, 1)	-0.227	0.062	-3.690	0.001
(0)	-0.325	0.070	-4.670	0.000

Table 6: Stock Price Adjustment on JSE to BREXIT Vote

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	0.062	0.036	1.730	0.090
(-3, 3)	0.044	0.040	1.090	0.280
(-2, 2)	0.028	0.043	0.660	0.512
(-1, 1)	-.0428	0.046	-1.0027	0.0316
(0)	-0.1489	0.056	-2.8949	0.0038

Table 7. : Stock Price Adjustment on JSE to Hurricane Michelle 10/29/2001

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	-0.061	0.027	-2.250	0.028
(-3, 3)	-.0062	0.029	2.260	0.029
(-2, 2)	-0.068	0.030	-2.290	0.028
(-1, 1)	-0.063	0.030	-2.120	0.042
(0)	-0.043	0.036	-1.180	0.251

Table 8. : Stock Price Adjustment on JSE to Hurricane Ivan 9/6/2004

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	-0.087	0.030	-2.850	0.006
(-3, 3)	-0.077	0.034	-2.240	0.030
(-2, 2)	-0.075	0.041	-1.830	0.075
(-1, 1)	-0.088	0.048	-1.820	0.079
(0)	-0.086	0.061	-1.410	0.174

Table 9 : Stock Price Adjustment on JSE to Jamaican General Elections 2002

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	-0.093	0.037	-2.550	0.013
(-3, 3)	-0.096	0.041	-2.320	0.024
(-2, 2)	-0.088	0.045	-1.980	0.055
(-1, 1)	0.109	0.054	-2.020	0.053
(0)	-0.021	0.038	-0.560	0.582

Table 10. : Stock Price Adjustment on JSE to Jamaican General Elections 2011

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	-0.123	0.030	-4.050	0.000
(-3, 3)	-0.133	0.035	-3.850	0.000
(-2, 2)	-0.135	0.040	-3.360	0.002
(-1, 1)	-0.130	0.046	-2.830	0.008
(0)	-0.058	0.047	-1.250	0.224

Table 11. : Stock Price Adjustment on BISX to Bahamas 2002 General Elections

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	0.069	0.034	1.990	0.051
(-3, 3)	0.084	0.039	2.160	0.035
(-2, 2)	0.094	0.044	2.160	0.037
(-1, 1)	0.126	0.053	2.370	0.025
(0)	0.073	0.053	1.390	0.181

Table 12. : Stock Price Adjustment on BISX to Bahamas 2012 General Elections

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	-0.060	0.029	-2.050	0.045
(-3, 3)	-0.075	0.033	-2.310	0.025
(-2, 2)	-0.037	0.029	-1.280	0.208
(-1, 1)	-0.059	0.034	-1.730	0.094
(0)	-0.056	0.042	-1.320	0.202

Table 13. : Stock Price Adjustment on BSE to Barbados 2008 General Elections

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	0.123	0.030	4.160	0.0000
(-3, 3)	0.119	0.034	3.550	0.001
(-2, 2)	0.108	0.035	3.040	0.004
(-1, 1)	0.100	0.042	2.370	0.025
(0)	0.071	0.055	1.280	0.215

Table 14. : Stock Price Adjustment on BSE to Barbados 2013 General Elections

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	-0.048	0.037	-1.300	0.197
(-3, 3)	-0.032	0.042	-0.780	0.442
(-2, 2)	-0.060	0.045	-1.350	0.185
(-1, 1)	--0.143	0.065	-2.200	0.039
(0)	-0.064	0.055	-1.160	0.255

Table 15. : Stock Price Adjustment on TTSE to Trinidad and Tobago 2002 General Elections

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	-0.087	0.037	-2.340	0.023
(-3, 3)	-0.088	0.039	-2.260	0.028
(-2, 2)	-0.096	0.045	-2.120	0.041
(-1, 1)	-0.048	0.039	-1.230	0.227
(0)	-0.053	0.049	-1.070	0.297

Table 16. : Stock Price Adjustment on TTSE to Trinidad and Tobago 2010 General Elections

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	-0.091	0.027	-3.440	0.001
(-3, 3)	-0.091	0.029	-3.110	0.003
(-2, 2)	-0.081	0.034	-2.410	0.021
(-1, 1)	-0.041	0.034	-1.210	0.235
(0)	-0.033	0.044	-0.740	0.467

Table 17. : Stock Price Adjustment on ECSE to Grenada 2008 General Elections

Event Window	Mean CAR	Robust Std. Err.	t- Stat	p - value
(-5, 5)	-0.092	0.045	-2.040	0.046
(-3, 3)	-0.098	0.053	-1.850	0.070
(-2, 2)	-0.113	0.064	-1.770	0.085
(-1, 1)	-0.130	0.082	-1.590	0.123
(0)	-0.027	0.031	-0.860	0.398

References

- Arteta, Carlos and Gakina Hale, 2008, "Sovereign Debt Crises and Credit to the Private Sector," *Journal of International Economics*, 69(1): 64-83.
- Arezki, Rabah, Candelon, Bertrand and Amadou Sy, 2011, "Sovereign rating News and Financial Market Spillovers: Evidence from the European Debt Crisis," *IMF Working Paper* No. 11/68.
- Barber, B, and J Lyon, 1996, "Detecting abnormal operating performance: The empirical power and specification of test statistics ." *Journal of Financial Economics* 41: 359 - 399.
- Barber, B, and J Lyon, 1997, "Detecting loong-run abnormal stock returns: The Empirical power and specification of test statistics," *Journal of Finance Economics* 43: 341 -37
- Barrett, B.W., Henson, A.J., Kolb, R.W. and Schropp, G.H, 1987, "The Adjustment of Stock Prices to Completely Unanticipated Events," *Financial Review*, 22, (4), 345-354
- Boehmer, E, J Musumeci, and A Poulsen,1991, "Event Study Methodology Under conditions of Event-induced Variance." *Journal of Financial Economics Vol* 30: 253 - 272.
- Brooks, R.M., Patel, Ajay and Su Tie, 2003, "How the Equity Market Responds to Unanticipated Events", *Journal of Business*, 76, (1), 109-133
- Beaver, W. "The Information content of annual earnings announcements." *Journal of Accounting Research Supplement* 6, 1968: 67 - 92.
- Brooks, Robert, Robert, Hillier, David Hillier, 2004, "The National Market Impact of Sovereign Rating Changes." *Journal of Banking and Finance*, Vol. 14, 3-31.
- Brown, Stephen, and Jerold Warner, "Using Daily Stock Returns: The Case of Event Studies." *Journal of Finance Economics* 14, 1985: 3 - 31.
- Borensztein, Eduardo and Ugo Panizza, 2009, "The Costs of Sovereign Default," *IMF Staff Papers*, vol. 56(4), 683-741.
- Borensztein, Eduardo, Kevin Cowan and Patricio Valenzuela, 2007, "Sovereign Ceilings "Lite"? the Impact of Sovereign Ratings on Corporate Ratings in Emerging Market Economies," *IMF Working Paper* 07/75, International Monetary Fund.
- Cantor, Bradford and Frank Packer, 1996, "Determinants and Impact of Sovereign Credit Ratings," *Federal Reserve Bank of New York Review*.
- Cornell, Bradford and Alan Shapiro, 1986, "The reaction of bank stock prices to the international debt crisis," *Journal of Banking and Finance*, 10(1): 55-73.

- Cowan, Arnold, and Anne Sergeant, 1996, "Trading Frequency and Event Study Test Specifications." *Journal of Banking & Finance*.
- Cruces, Juan and Christoph Trebesch, 2011, "Sovereign Defaults: The Price Of Haircuts." CESifo Working Paper, No. 3604.
- Das, Udaibir S., Papaioannou, Michael G. and Christopher Trebesch, 2010, "Sovereign Default Risk and Private Sector Access to Capital in Emerging Markets", *IMF Working Papers* 10/10, International Monetary Fund.
- Das, Udaibir S., Papaioannou, Michael G. and Christopher Trebesch, 2010, "Spillovers of Sovereign Default Risk: How Much Is the Private Sector Affected?" in *Sovereign Debt: From Safety to Default*, ed. Kolb, R. W., 33-42, New York: Wiley.
- Das, Udaibir S., Papaioannou, Michael G. and Christopher Trebesch, 2012, "Sovereign Debt Restructurings 1950-2010: Literature Survey, Data and Stylized Facts." *IMF Working Papers*, Working Paper 12/203.
- Dimson, E, 1979, "Risk measurement when the shares are subject to infrequent trading" *Journal of Financial Economics* 7(2): 197-226
- Eaton, Jonathan and Mark Gersovitz, 1981, "Debt with Potential Repudiation: Theoretical and Empirical Analysis," *Review of Economic Studies*, 48 (2): 289-309
- Fama, E., and K. French, 1993, "Common risk Factors in the returns on stocks and bonds." *Journal of Financial Economics* 33: 3-56.
- Fama, E., L.Fisher, M.Jensen, and R.Roll, 1969, "The adjustment of stock prices to new information." *International Economic Review* 10: 1-21.
- Fama, Eugene. "Efficient Capital Markets II, 1991," *The Journal of Finance*, Vol. 46, No. 5., 1575-1617.
- Fama, Eugene, 1979, "Efficient Capital Markets: A review of theory and empirical work." *Journal of Finance*, 383-417.
- Fama, Eugene, 1998, "Market Efficiency, long-term returns, and behavioral finance." *Journal of Financial Economics*: 283-306.
- Fissel, gary, Goldberg, lawrence and Gerald Hanweck, 2006, "Bank Portfolio Exposure to Emerging Markets and its Effects on Bank Market Value," *Journal of Banking and Finance*, 30(4): 1103-1126.

- Fuentes, Miguel and Diego Saravia, 2010, "Sovereign Defaulters: Do International Capital Markets Punish Them?" *Journal of Development Economics*, 91(2): 336-347.
- Gelos, Gaston R., Guido Sandleris and Ratna Sahay, 2004, "Sovereign Borrowing by Developing Countries: What Determines Market Access?", *IMF Working Paper* 04/221, International Monetary Fund.
- Grossman, Stanford, 1976, "On the Efficiency of Competitive Stock Market Where Traders Have Diverse Information." *Journal of Finance* 3: 573 - 585.
- Hooper, V., T. Hume and S.K. Kim, 2005, "Sovereign Rating Changes – Do They Provide New Information for Stock Markets, Working paper, University of New South Wales.
- Kaminsky, G. and S.L. Schmukler, 2002, "Emerging Market Instability: Do Sovereign Ratings Affect Country Risk and Stock Returns?" *World Bank Economic Review* 16, 171-195.
- Kim, M. K. and C. Wu, 2004, "Macroeconomic Factors and Stock Returns," *Journal of Financial Research* 10, 87-98.
- Khotari, S., and J. Warner, 2006, "Econometrics of Event Studies." *Handbook of Corporate Finance: Empirical Corporate Finance*: 2-53.
- Klimaviciene, Asta., Pilinkus, Donatus, 2011, "The Impact of Sovereign Credit Rating Changes on Stock Markets In Central and Eastern Europe," *Transformation In Business & Economics*, 10, 87-103.
- Kothari, S., and J Warner, 1997, "Measuring Long-Horizon security price performance." *Journal of Financial Economics*: 301 -339.
- Kothari, S., J. Shanken, and R. Sloan, 1995, "Another look at the cross-section of expected returns." *Journal of Finance* 50: 185-224.
- Love, Inessa, preve, Lorenzo A. and Virginia Sarria-Allende. 2007. "Trade Credit and Bank Credit: Evidence from recent Financial Crises," *Journal of Financial Economics*, vol. 83 (2): 453-469.
- MacKinlay, A. C., 1997, "Event Studies in Economics and Finance." *Journal of Economics Literature* 35: 13-39.
- Martinez, Jose Vincente and Guido Sandleris. 2008. "Is it Punishment? Sovereign Defaults and the Decline in Trade," "Business School Working Paper 2008-01, Universidad Torcuato Di Tella.

- Michaelides, Alexander, Andreas Milidonis, George Panayiotis & Nishiotis Papakyriacou, 2012, "Sovereign debt Changes and The Stock Market," CEPR Discussion Paper No. DP8743
- Norden, & Weber (2004), "The Co-movement of Credit Default swap, Bond and Stock Markets," Center for Financial Studies Discussion paper.
- Patro, D., and Y. Wu, 2004, "Predictability of short-horizon returns in international equity markets." *Journal of Empirical Finance* 11: 553 - 584.
- Pukthuanthong-Le et al (2007), "Sovereign Credit Rating Announcements and Baltic Stock Markets," *Organizations and Markets In Emerging Economies* (2) 51-62
- Pynnönen, Seppo, and James Kolari, 2006, *Event-Study Methodology: Correction for Cross-Sectional Correlation in Standardized Abnormal Return Tests*. Working Paper, Texas: Finance Department Texas A&M University , 2006.
- Richmond, Christine and Daniel A. Das, 2009, "Duration of Capital Market Exclusion: An Empirical Investigation." Unpublished Paper, UCLA.
- Robinson, Justin. "Stock Price Behavior in Emerging Markets: Tests for Weak Form Market Efficiency on the Jamaica Stock Exchange." *Social and Economic Studies* 54:2, 2005: 51 - 69.
- Rose, Andrew K, 2005, 'One Reason Countries Pay their Debts: Renegotiation and International Trade.' *Journal of Development Economics*, 77(1): 189-206.
- Watson, Patrick, K, 2009,. *The Efficiency of the Stock Market in the CARICOM sub-region: an Empirical Study*. Working Paper, Trinidad and Tobago: University of the West Indies.